APPENDIX A

Remedial Action Implementation - Atlas Asbestos Mine Superfund Site

The purpose of this appendix is to provide information on the remedial actions implemented at the Atlas Asbestos Mine Superfund Site (Atlas Mine Area) including any deviations from the selected remedy. The remedial actions were conducted to mitigate potential endangerment of human health and/or the environment.

Remedial Action Implementation

Atlas Corporation and Vinnell Mining and Minerals Corporation, the responsible parties for the Atlas Mine Area, entered into the consent decree with the United States Environmental Protection Agency (USEPA) on August 13, 1992 and agreed to implement the remedy selected in the Record of Decision (ROD). Bureau of Land Management (BLM) subsequently entered into a separate agreement with the Atlas Corporation and Vinnell Corporation to perform the operation, maintenance, and revegetation at the site. The Remedial Action Design Plan (RADP) was approved on June 22, 1994 (HLA 1993).

Construction activities began on October 20, 1994, and continued until May 5, 1995, when rain and surface-water accumulation forced suspension of construction activities. Construction resumed on September 11, 1995, and was completed on November 14, 1996. USEPA issued a preliminary closeout report for the Atlas Area OU on September 2, 1999, confirming that the construction phase of the remedy was completed and operating properly (USEPA 1999). The remedial features at the Atlas Asbestos Mine site are described in the following sections.

Surface Impoundments

Ponds A, B, D, E, and G were constructed as designed in the RADP to retain sediment from stormwater runoff. Pond F was deleted from the remedial action as part of the Remedial Design Modifications (Revised) letter from the potentially responsible parties (PRPs) to the USEPA dated October 19, 1995. Pond C construction was completed without removing all of the silt that had accumulated in the bottom during the heavy rains of spring 1995. The impoundments were constructed to pass the flow from a 100-year storm event through a piped spillway or outlet structure and discharge into the existing channels downstream. The Pond F area was graded to direct surface water into a ditch that intersects Pond E dissipater pad area.

Ponds A, B, C, E, and G were constructed with a piped outlet structure and Pond D was constructed with an open channel spillway structure. Two sediment storage areas were constructed: one near Ponds A and B that has at least a one-year pond capacity and one near Pond E that has at least a six-year site capacity. These storage areas are located adjacent, or as near as possible, to the impoundments so as not to interfere with runoff or contribute to sediment deposition within the impoundments.

Channel Protection

Channels were constructed to prevent further erosion of existing tailings from the previous asbestos mining operation. The two channels constructed are Channel A and Channel B, located on the west and northeast areas of the site, respectively. The graded channels are protected with rock-filled gabions with filter fabric beneath the gabions to prevent fine-grained underlying soil from migrating through the gabions. Channel A is approximately 1,500 feet in length with slopes ranging from approximately 10 percent to 41 percent. The lower end of Channel A was shortened by approximately 30 feet to minimize destruction of existing vegetation stabilizing slopes in the area against erosion. Channel B cuts through native soil and rock adjacent to tailings on the east side of the site. The channel is approximately 1,400 feet in length with slopes ranging from approximately 1 percent to 26 percent. Sideslopes are nearly vertical where the channel was constructed into existing rock. The lower end of Channel B was shortened by approximately 30 feet due to groundwater seeps and narrowed by approximately 3 feet in areas with steep, rocky side slopes.

Other Diversions and Site Improvements

The roadside ditch along the Pond A access road was constructed to intercept surface water flow and divert the water away from the site toward Diversion Channel B. The Pond A access road was realigned along the cutslope above Pond B in order to maintain access to Pond A during substantial storm events. Storm water diversion berms were constructed north of Pond B area to divert runoff from upland areas around disturbed areas toward Diversion Channel A and to divert runoff from within the disturbed area to surface impoundments.

A double bituminous paved cap was constructed on the main access road through the site to minimize dust emissions and provide improved access for future maintenance activities. The cap was constructed with two layers of imported chipped and cleaned rock and bituminous material conforming to American Society for Testing and Materials Standard D2397. The gates on the main access road were relocated as shown on the Record Drawings in the Remedial Action Completion Report (RACR). A soil stabilizer was applied to ponds access roads to minimize dust emissions.

Mill Site Area

Two steel storage tanks containing asbestos and miscellaneous scrap metal were demolished from the former Mill Site area. The scrap metal and material were buried in the disposal area shown on the Record Drawings (which can be found in the RACR). Although not a part of the approved remedial design, a pool of oil located near the Mill Site area was mixed with chemical nutrients to encourage bioremediation and buried in the disposal area.

Supplemental Site Modifications

Supplemental site modifications were constructed at the Rover Pit area and the Pond A access road in response to an USEPA request dated June 13, 1995, a site inspection coordinated with Ecology and Environment, Inc. (E&E), and several teleconferences among all parties associated with the project. The final revised design modifications were submitted to the USEPA in a letter from the PRPs dated October 19, 1995. Supplemental

design modifications were approved by USEPA on February 1, 1996. Construction of the design modifications is described below.

- The bottom of the Rover Pit was regraded and compacted to route runoff to an armored controlled outlet. The outlet was lined with filter fabric and filled with riprap to minimize erosion. The modification was constructed to minimize uncontrolled flow from the mining face through the pit.
- A surface-water diversion was constructed across a part of the Pond A access road north of the road realignment. The original design specified the installation of an 18-inch corrugated metal pipe (CMP) of. During the 1995 field construction activities, a field modification by the supervising construction manager was made where it was decided that a water bar (diversion) would provide better drainage than an 18-inch CMP. The decision was made to minimize future CMP maintenance requirements.
- Channel B and sedimentation storage markers were modified (telephone poles were used instead of staff gauges due to unavailability of material) at the request of USEPA under the direction of Environmental Strategies Corporation. The site modifications were reviewed and approved by USEPA's contractor CH2M HILL in September 1999, constructed in October 1999, and approved in November 1999.

Revegetation

The selected remedy specified by the ROD required that a revegetation study be conducted to evaluate whether native vegetation could be established on disturbed areas of the Atlas Mine Area OU. Consequently, in 1994 the BLM contracted with Bitterroot Native Growers (BNG) of Corvallis, Montana to conduct a revegetation project for the site. The project involved a pilot study followed by three phases of planting. During the planting phases, 3,100 cubic yards of soil amendment were applied to 18.5 treatment acres, over 10,000 individual plants were planted, and 9.26 acres of the treated area were hydroseeded.

Field trials were conducted in late 1994 and 1995 with the planting of a Pilot Project study area, located within the perimeter of Pond D, to test the species and soil amendments at the site and to determine effective field techniques for conducting full-scale revegetation. A revegetation pilot program was implemented in the southwest section of Pond D above the high-water line, as required in the Consent Decree. The pilot study was designed to evaluate whether native vegetation could be established on disturbed areas.

During the following years, full-scale planting was implemented to reduce wind and water erosion through: the application of soil amendment with organic composts, slow-release fertilizer, and gypsum; contour strip planting of live shrubs inoculated with site-specific mycorrhizal inoculum; and grass/forb seed applied as a hydroseeded slurry. The work was conducted in three phases, with BNG conducting annual planting and monitoring of the previous year's efforts.

In June 1999, USEPA's contractor, CH2M HILL, conducted a brief visual survey to determine the relative success, up to that point of time, of the revegetation efforts at the site. At the time of the survey, much of the vegetation from the three phases of planting was living and appeared to be potentially viable. Overall, each successive phase of planting appeared to be increasingly successful. This was possibly because the results of the previous

year's planting demonstrated the more efficient plant species and soil amendments and provided data for BNG botanists. The areas from the three phases of planting are presented in Figure 4-1 of the 5-year Report.

Deviations from Approved Construction Documents

The following section identifies deviations that occurred during construction. The USEPA and their representative from E&E were formally informed of the revisions during onsite meetings and monthly conference calls. Design modifications from approved construction documents were approved by USEPA in their February 1, 1996 letter.

- Pond A outlet modifications included reducing the slope angle of the corrugated metal pipe (CMP) outlet to achieve a safer operating condition during construction.
- The access road north of Diversion Channel B at the inlet to the channel was excavated to an elevation of 4,166 feet instead of 4,170 feet to minimize ponding of water near the outlet of Pond G overflow pipe and dissipater pad.
- The sideslope angles of the Regional Sediment Storage Area were changed to avoid construction of sliver fills and to modify the existing slope at an isolated location to catch the tailings pile above the deviation which resulted in a slope of 2.8:1 (horizontal:vertical). The slope height at 2.8:1 is approximately 13 feet vertical, transitioning back to the designed slope of 3:1 for 40 feet horizontal both north and south of the erosion channel.
- The northeast leg of Diversion Channel A was shortened by approximately 30 feet to minimize destruction of existing vegetation that is currently stabilizing the slopes in this area against erosion.
- The sideslopes of Diversion Channel B in the areas determined to be rocky during excavation were changed to an angle of approximately 1:1 in order to minimize disturbance of existing dense and well-established vegetation.
- Loose rock on top of geotextile fabric was installed for the lowest 30 feet of Diversion Channel B due to water flowing from a local spring.
- Approximately 1,040 feet of gabions were installed as part of Diversion Channel B with a width of 18 feet instead of 21 feet due to the steep slope on the eastern side of the channel.
- The bottom of Pond C was not compacted due to water accumulation at the pond bottom from local seeps.
- The slope of the main berm of Pond C exceeds 2:1 due to water accumulation at the pond bottom from local seeps.
- Approximately 120 feet of the upper left fork of Diversion Channel A was constructed with 1-1/2-foot depth gabions instead of two 9-inch depth gabions.
- Polyfelt TS 500 geotextile fabric as used to complete construction of Diversion Channel A, the dissipater pads for Pond C and Pond E, and the Pond A access road crossing due to unavailability of the specified Mirafi 700X geotextile fabric.

- The 80-foot length of channel downstream of the Pond E overflow dissipater pad was constructed using geotextile fabric and loose rock instead of installing gabions. The channel is relatively flat, and standing water prevented the excavator from tracking down the channel to fill the gabions with rock.
- An access gate was not installed near the main road by Pond C because better access to Pond C may be obtained on the construction road located at the northeast corner of the pond.
- Treated Class 4 Douglas fir telephone poles were substituted for the staff gauges specified due to unavailability of material.
- Pond B and Pond C staff gauges were not installed at the locations shown on the Design Drawings due to inaccessibility from water accumulation in the ponds.
- Both layers of the double-chip seal road were constructed using 3/8-inch No. 6 washed rock due to unavailability of the rock specified.
- BLM gates originally located at Spanish Lake and at the lower entrance were relocated in accordance with the Design Drawings. Gates from Pond A and Pond B access roads were removed and reinstalled with new gate posts at the original locations.
- Improved drainage ditches near Pond A and Pond B entrance gates, along west side of main road, and east side of entrance to Pond E.
- Extended fence at north site access gate.

An inspection was conducted on December 13, 1995, and was attended by Richard E. Blubaugh and Jim Fontana from the Atlas Mine Site Committee (AMSC), Richard Procunier with USEPA, Tim Moore with BLM, Ron Anderson with E&E, Rich Wesenberg with Harding Lawson Associates (HLA), and Bill Gore and Gene Wilson with Scrivner Environmental Services, Inc. A prefinal inspection of the Altas Mine Area OU was subsequently conducted by USEPA on August 22, 1996. Based upon this inspection, USEPA issued a letter to the PRPs, dated November 14, 1996, confirming that the construction phase of the remedy was completed and operating properly, and subsequently issued a preliminary closeout report for the Atlas Area OU on September 2, 1999 (USEPA 1999).

Access Controls

Portions of the perimeter of the site have been fenced, and berms along White Creek road have been constructed by the BLM to discourage access of the Atlas Mine Area. The site is routinely inspected by BLM to discourage trespassing and to identify activities of vandalism. In addition, access to the site is further limited by two locked gates on White Creek Road above the site and two locked gates on the same road below the site. Signs are clearly posted and maintained by BLM. The locks are managed by BLM.

References

Harding Lawson Associates (HLA). 1993. *Remedial Action Design Plan for Atlas Mine Superfund Site.* December.

United States Environmental Protection Agency (USEPA). 1999. *Preliminary Closeout Report for Atlas*. September 2.

Appendix B
USEPA 1992 Public Notice

EPA

December 1992

Atlas and Coalinga Asbestos Mines Superfund Sites

Coalinga, California

United States Environmental Protection Agency, Region IX, San Francisco

✦ PUBLIC NOTICE ✦

Status of Clear Creek Management Area and Arroyo Pasajero Ponding Basin

FRESNO AND SAN BENITO COUNTIES

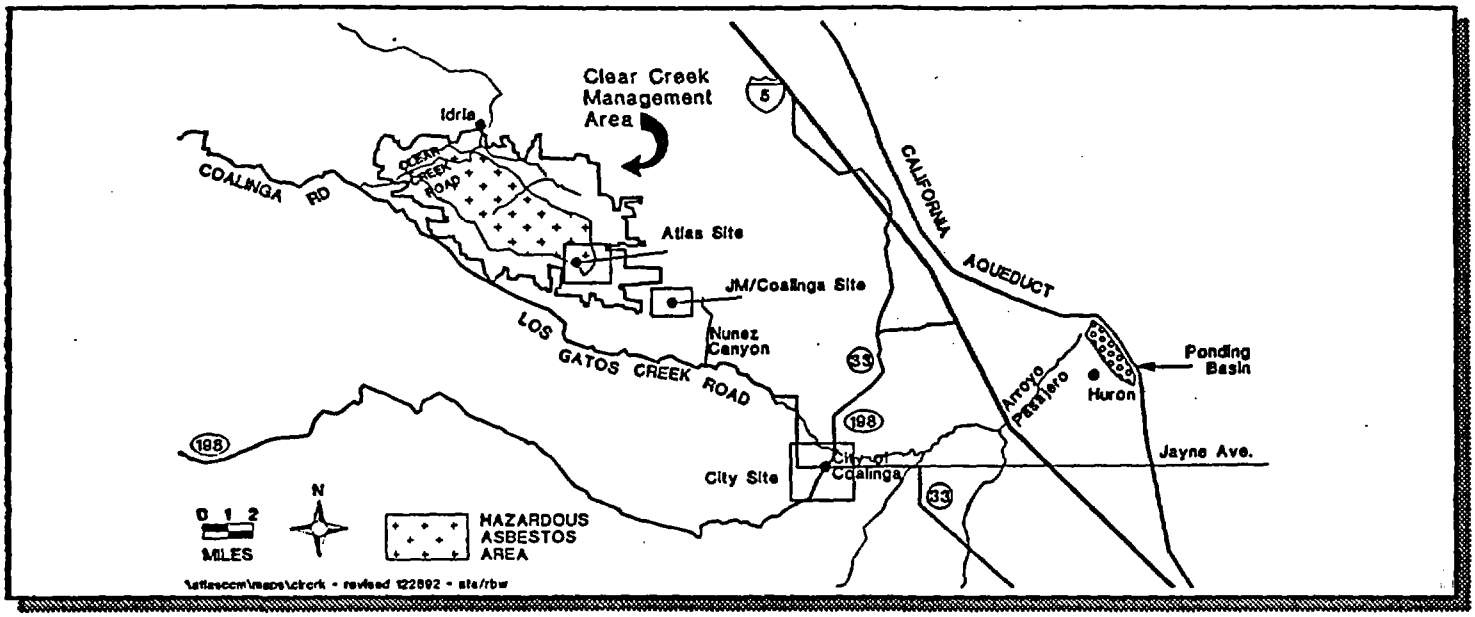
In September of 1990 and February of 1991, the United States Environmental Protection Agency (EPA) issued Records of Decision for the Coalinga Superfund Site and the Atlas Superfund Site, respectively. In those decision documents, EPA announced the remedies selected for the asbestos waste at certain areas of those Superfund sites. EPA also indicated that, by the end of 1992, it would evaluate whether further action by EPA was necessary at the Clear Creek Management Area, which is part of the Atlas Site, and at the Arroyo Pasajero Ponding Basin which is part of both the Atlas and Coalinga Sites. This public notice announces the results of those evaluations.

CLEAR CREEK MANAGEMENT AREA:

The Bureau of Land Management (BLM) of the Department of Interior has assessed the risks posed by naturally occurring asbestos and asbestos waste in the Clear Creek Management Area. BLM has not yet determined how its Resource Management Plan should be altered to address these risks. It will issue a draft revision of its plan and an Environmental Impact Statement for public comment in 1993. EPA will remain involved in BLM's planning and analysis process in order to help ensure protection of public health and the environment from the asbestos waste in this area.

ARROYO PASAJERO PONDING BASIN:

The Bureau of Reclamation (BOR) of the Department of Interior and the California Department of Water Resources (DWR) jointly manage the Arroyo Pasajero Ponding Basin water project. EPA is satisfied that these agencies' plans are adequate to address the threat from asbestos waste in the Ponding Basin. The two threats identified by EPA were the generation of airborne asbestos during agricultural activities and the overflow of asbestos laden run-off into the California Aqueduct. To address these threats BOR and DWR plan to (1) plant cover crops, which will reduce agricultural activities and resulting airborne asbestos, and (2) expand the ponding basin and take other actions which will reduce the chances of asbestos run-off entering the Aqueduct. As a result, EPA will take no further action under the Comprehensive Environmental Response Compensation and Liability Act (Superfund law) in this area.



FOR MORE INFORMATION

If you have any questions, want to add a name to our mailing list or would like more information on the Atlas Mine, Johns Manville Coalinga Asbestos or the City of Coalinga Superfund sites, please contact:

INFORMATION REPOSITORIES

Coalinga District Library
305 N. 4th Street
Coalinga, CA 93210
(209) 935-1676

Avenal Public Library
501 East Kings
Avenal, CA 93204
(209) 386-5741

Huron City Hall
36311 Lassen Ave.
Huron, CA 93234
(209) 945-2241

Kings County Library
401 North Douty
Hanford, CA 93230
(209) 582-0261

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Region 9
75 Hawthorne Street (H-1-1)
San Francisco, CA 94105
Attn: Angeles Herrera

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INSIDE: Update on Activities at the Atlas / Coalinga Asbestos Superfund Site

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Appendix C
Geographic Areas of Atlas Mine Area OU

Appendix C1
Arroyo Pasajero Ponding Basin

APPENDIX C1

Arroyo Pasajero Ponding Basin

The purpose of this appendix is to provide the status and updated technical information on the Arroyo Pasajero Ponding Basin (Ponding Basin). The Ponding Basin, which is geographically located within the Atlas Asbestos Mine Superfund Site, was identified because of concerns that asbestos mining and milling waste from the Atlas Mine Area were being transported to this area by water or wind.

Background

The Ponding Basin is approximately 30 miles east of the Atlas Mine Area. It is located between State Highway 198 and Gale Avenue to the West of the California Aqueduct. Intermittent streams in the Atlas Mine Area and Johns Manville Mill Area drain into Los Gatos Creek, a tributary to the Ponding Basin. The Ponding Basin is designed to hold floodwaters from the Arroyo Pasajero alluvial fan.

In the Record of Decision (ROD) for the Atlas Mine Area Operable Unit (USEPA 1991), the United States Environmental Protection Agency (USEPA) states that it is not taking any action in the Ponding Basin because the United States Bureau of Reclamation (USBR) and the Department of Water Resources (DWR) are considering actions to minimize the generation of asbestos-laden dust and to prevent run-off to the California Aqueduct. The ROD further provided that USEPA will evaluate whether USBR's and DWR's plan protects human health and the environment, and will publish a public notice of its determination.

In 1992, USEPA published a public notice regarding the status of the Ponding Basin (Appendix B). In that notice, USEPA stated that plans for the Ponding Basin established by the USBR and DWR were adequate to address the threat from asbestos. These plans included (1) planting cover crops to reduce exposure to airborne asbestos and (2) expanding the ponding basin to reduce chances of asbestos run-off from entering the California Aqueduct. USEPA stated it would take no further action regarding the Ponding Basin under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). However, because the Ponding Basin is a geographic area within the Atlas Mine Area, activities that have occurred at the Ponding Basin in the last five years are summarized in this appendix for completeness.

Site Inspection

A site inspection of the Ponding Basin was performed on May 2, 2006. Representatives from USEPA, CH2M HILL, and DWR were in attendance. It was noted that areas adjacent to Gale Avenue have been developed agriculturally; however, these areas are not within the boundaries of the Ponding Basin specified in the ROD.

Vegetation and gravel-covered roads were observed to be in satisfactory condition and prevent airborne asbestos from being generated; however, trespassers are driving in areas

without gravel or vegetation, which likely results in generation of airborne asbestos. Fencing and signage are partially installed along the aqueduct and portions of the Ponding Basin, but are not adequate for preventing trespassers from accessing the site.

The site inspection form for the Ponding Basin, as well as photos from the site inspection, can be found in Attachment 1.

Status of Recent Activities at the Ponding Basin

Expansion of Ponding Basin and Flood Control

From approximately 2004 to 2005, the Ponding Basin was expanded to provide flood protection against 100-year flood events. In addition, flood control structures were installed south of Gale Avenue to provide 25-year flood protection. To prevent water from entering the vegetated areas and the California Aqueduct, gabion weirs were installed at the southern end of the Ponding Basin.

Water is discharged from inlet drains in the Ponding Basin to the California Aqueduct approximately once every 7 years for flood control purposes. Prior to discharge, surface water samples are collected to ensure elevated constituent concentrations are not released into the aqueduct. The last discharge occurred on January 13, 2005. Attachment 2 presents the analytical data from the samples collected during that discharge event.

Three samples were collected from this event and analyzed for asbestos fibers with lengths greater than 10 micrometers (μm). The first sample was collected prior to discharge. It contained asbestos detected at a concentration of 4.4 million fibers per liter (MFL). After discharge, a sample collected from the California Aqueduct at a location directly downstream at Gale Avenue contained asbestos detected at a concentration of 2.2 MFL. A third sample collected from the California Aqueduct at Quail Avenue's crossing, 12 miles downstream of discharge point, did not contain asbestos at a concentration above the detection limit of 2.2 MFL.

In addition, from April 1981 to August 2003, data were collected from monitoring stations upstream and downstream of the Ponding Basin in the California Aqueduct. Banks Pumping Plant monitoring station is approximately 120 miles upstream of the Ponding Basin. Kettleman City monitoring station is approximately 20 miles downstream, and Station 41 is approximately 100 miles downstream of the Ponding Basin. As presented in Attachment 2, chrysotile asbestos (fibrous serpentine) was not detected above detection limits (0.2 MFL to 2.2 MFL) in samples collected both upstream and downstream of the Ponding Basin.

Recent Soil Sampling Event and the Construction of Dikes

From February 9 to February 11, 2004, samples were collected by DWR's Division of Environmental Services, Environmental Site Assessment Section personnel at five locations west of the Ponding Basin (DWR 2004). The purpose of the sampling event was to determine the presence or absence of naturally-occurring asbestos in the soil matrix in the vicinity of the Ponding Basin and to assess the appropriateness for use of the soil matrix as fill material for construction activities. These five locations include: Arroyo Pasajero Channel, Huron Waste Water Treatment Plant, San Joaquin Valley Railroad Crossing, Gale Avenue, and the western embankment of the San Luis Canal.

One hundred samples were collected and sent to Asbestos TEM Laboratory for analysis of asbestos using polarized light microscope, California Air Resources Board (CARB) Method 435. Asbestos fibers detected in all samples were characterized as chrysotile. No other asbestos types were detected. Approximately 44 percent of the samples had reported asbestos contents of less than 0.25 percent. Fifty-four percent of the samples had reported asbestos contents ranging from 0.25 percent to 1.00 percent. Two percent of the samples had a reported asbestos concentration greater than 1.00 percent. Attachment 3 presents the analytical data and locations for these samples.

This soil was used to construct dikes that serve as roads west of the Ponding Basin along the north side of Gale Avenue. Four to six inches of clean gravel were placed over the soil to prevent exposure to the asbestos. Because reported asbestos concentrations in the soil exceeded 0.25 percent in 56 percent of the samples, construction activities at the Ponding Basin were subject to the CARB Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations and the CARB ATCM for Surfacing Applications. The soil with reported asbestos concentrations greater than 1.0 percent was subject to permissible exposure limits specified in Section 1529(c) of Title 8, California Code of Regulations (DWR 2004).

Summary and Recommendations

Currently, discharges to the California Aqueduct are controlled with the expansion of the Ponding Basin, and installation of flood control structures and gabion weirs. Controlled releases are only made when necessary for flood control purposes, and samples are collected prior to such releases to ensure elevated constituent concentrations are not released to the aqueduct.

In the vicinity of the Ponding Basin, vegetation and gravel-covered roads prevent airborne asbestos from being generated by vehicular and human activities; however, a maintenance program should be developed to ensure that the gravel layer on top of the recently-constructed levee roads is maintained over time to prevent exposure to asbestos in the roads. In addition, fencing and signage at the perimeter of the Ponding Basin should be improved to prevent future access to the Ponding Basin by trespassers. At the request of USEPA, DWR has indicated that they will identify measures to address these issues and will incorporate these measures into an existing maintenance plan for the Ponding Basin (DWR 2006).

References

Department of Water Resources (DWR). 2004. Sampling of Designated Borrow Areas for Naturally-Occurring Asbestos Sampling Report. May.

_____. 2006. Telephone conversation between Ghassan Algaser/DWR and Lynn Suer/USEPA on July 27, 2006.

United States Environmental Protection Agency (USEPA). 1991. *EPA Superfund Record of Decision – Atlas Asbestos Mine OU #01*. February.